FIVE-YEAR REVIEW

Compass Industries
OKD980620983
Tulsa County, Oklahoma

This memorandum documents the U.S. Environmental Protection Agency's (EPA) approval of the Compass Industries Five-Year Review Report prepared by the U.S. Army Corps of Engineers on behalf of EPA.

Summary of Five-Year Review Findings

The remedy of a RCRA type cap over the 43-acre landfill is operating as designed. Water samples from the shallow aquifer exposed in seeps adjacent to the cap, and surface water were below action levels set forth in the Operating and Maintenance Plan. The cap is in good condition, and minor repairs have been made. Settlement of the cap has been minimal.

Actions Needed

No major deficiencies were noted. To ensure future protectiveness, the following actions are recommended: 1] the grass should be mowed every four years; 2] woody vegetation should be removed; 3] periodic check of the cap to repair soil erosion and prevention of burrowing animals.

Determinations

I have determined that the remedy for the Compass Industries is protective of human health and the environment, and will remain so provided the action items identified in the Five-Year Review Report are addressed as described above.

Myron O. Knudson, P.E.
Director
Superfund Division
U. S. Environmental Protection Agency
Region 6

9/26/00
Date

CONCURRENCES

FIVE-YEAR REVIEW

for the

Compass Industries

9/1/00

Shawn Ghose M.S., P.E.
Remedial Project Manager

9/5/00

Tracy Sheppard
Staff Attorney

for 9/20/00

Gus Chavarria
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9/20/00

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9-21-00

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Superfund Division

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Executive Summary

This documents the Five-Year Review of the Compass Industries Site in Tulsa County, Oklahoma, which was scheduled to be completed in 1995. The remedy for the site consists of a RCRA-type Cap over a 43-acre landfill. Post-completion activities consist of obtaining and analyzing samples of the water from seeps located adjacent to the site and from the surface of the cap; inspecting the cap for deterioration and settlement; and, maintaining the site as a secured area.

The remedy, including the post closure Operations and Maintenance, is protective of human health and the environment. The remedy is functioning as designed. The cap is generally in good condition, with noticeable minor repairs having been made in the past. Settlement has been minimal. All analyses of the seep and surface water have shown no contaminants above the remedy threshold. The fence has kept the site generally secure with only infrequent trespassing noted.

Because waste is left in place, another five-year review is scheduled for the first quarter of FY 2001. It is recommended that this site be considered for partial or complete deletion from the NPL.

Acronyms

BDL	Below Detection Limit
BOD	Biochemical Oxygen Demand
CERCLA	Comprehensive Environmental Response, Compensation. and Liability Act
COD	Carbon Oxygen Demand
COE	Corps of Engineers, Tulsa District
EPA	U.S. Environmental Protection Agency
HDPE	High Density Polyethylene
HRS	Hazard Ranking Score
I.G.	Interagency agreement
mg/l	milligrams per liter (ppm)
NCP	National Contigency Plan
NPL	National Priorities List
OSDH	Oklahoma State Department Of Health
OWSER	Office of Solid Waste and Emergency Response
O&M	Operations and Maintenance
PCB	Polychlorinated Biphenyls
ppb	parts per billion
ppm	parts per million
PRP	Potentially Responsible Party
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation/Feasibility Study
ROD	Record of Decision
TOC	Total Organic Carbon
TSS	Total suspended Solids
ug/l	micrograms per liter (ppb)

Five-Year Review Summary Form

SITE IDENTIFICATION

Site name *(from WasteLAN)*: Compass Industries (Avery Drive)

EPA ID *(from WasteLAN)*: OKD980620983

Region: 6	**State:** OK	**City/County:** Tulsa/Tulsa

SITE STATUS

NPL Status: ☒ Final ☐ Deleted ☐ Other (specify) _____

Remediation Status (choose all that apply): ☐ Under Construction ☐ Operating ☒ Complete

Multiple OUs?* ☐ Yes ☒ No	**Construction Completion Date:** 10/__/1990

Has site been put into reuse? ☐ Yes ☒ No

REVIEW STATUS

Reviewing agency: ☒ EPA ☐ State ☐ Tribe ☐ Other Federal Agency _____

Author name: Shawn Ghose M.S., P.E.

Author title: Remedial Project Manager	**Author affiliation:** EPA, Region 6

Review period:** 10/__/1990 to 05/__/1995

Date(s) of site inspection: __/__/____

Type of review:*** ☒ Statutory
☐ Policy (☐ Post-SARA ☐ Pre-SARA ☐NPL-Removal only
☐ Non-NPL Remedial Action Site☐ NPL State/Tribe-lead
☐ Regional Discretion)

Review number: ☒ 1 (First) ☐ 2 (Second) ☐ 3 (Third) ☐ Other(specify) _____

Triggering action:****
☐ Actual RA Onsite Construction at OU #____ ☐ Actual RA Start at OU#____
☒ Construction Completion ☐ Previous Five-Year Review Report
☐ Other (specify) _____

Triggering action date *(from WasteLAN)*: 10 /__/1990

Due Date *(five years after triggering action date)*: 10/__/1995

* ["OU" refers to operable unit.]
** [Review period should correspond to the actual start and end dates of the five-year review in WasteLAN.]
*** [see page A-18 and Chapter 1 for further explanation.]
**** [see page A-19 and Chapter 1 for further explanation.]

Five-Year Review Summary Form

Deficiencies:

No deficiencies were noted during the Five-Year Review, as the data were adequate and the site inspection revealed no major deficiencies. However, several potential deficiencies were identified during the inspection. These included:

a) possible buildup of thatch;
b) woody plants with strong root systems which may damage the liner system;
c) burrowing animals may also damage the liner system; and
d) erosion of the protective soil continues to be a concern.

Recommendations and Follow-up Actions:

a) If mowing continues the site should be raked approximately every four years.
b) Woody vegetation should be removed at least annually.
c) Periodic checks for burrowing should be continued.
d) The cap should be inspected periodically to ensure that the full 24-inches remains intact.

Protectiveness Statement(s):

The remedial action is expected to be protective. Therefore, the remedy for the site is protective of human health and the environment.

Other Comments:

The site should be considered for deletion from the NPL.

I. Introduction

The Compass Industries Superfund Site is a former landfill which has been capped, with none of the contaminants removed. Remedial Action at the site began in 1990 and was essentially complete that same year. The site is currently under Operations & Maintenance (O&M) and is restricted from public or private use.

The purpose of this report is to document the First Five-Year review and to comply with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), as amended, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and the Office of Solid Waste and Emergency Response (OWSER) Guidance 9355.7-03B-P/EPA 540 R-98-050, dated October 1999.

This review has been performed pursuant to Section 121 (c) of CERCLA which states:

> "If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented."

Subpart E of the NCP [40 CFR 300.430(f)(4)(ii)] delegates this responsibility to the lead agency, in this case the U.S. Environmental Protection Agency (EPA).

This report is provided by the U.S. Army Corps of Engineers, Tulsa District (COE), under EPA Interagency Agreement (I.G.) No. DW96934255-01-06 for Hazardous Waste Enforcement Support at the Compass Industries, Oklahoma, site. The EPA has utilized the Tulsa District as its sole oversight agent throughout the Remedial Design, Remedial Action, and Operations and Maintenance (O&M) of the site. Under this I.G., the Tulsa District provided full-time on-site monitoring during the remedial action and has monitored the O&M contractor and performed Quality Assurance testing. The Tulsa District has assisted the EPA, alerting it to O&M activities, providing technical assistance, and enforcing EPA's requirements.

This report summarizes the data obtained under this agreement and provides the technical recommendations for continued activity at the site. This information has been summarized on the Five-Year Review Summary Form.

II. Chronology of Remediation Activities

A brief chronology of the activities concerning the Compass Industries site and involving the EPA is provided in Table 1.

III. Background

A Site Location and Description

The Compass Industries Superfund Site is located in western Tulsa County, Oklahoma, near the community of Berryhill (Figure 1). The remediation area occupies approximately 50 acres in the northeastern portion of the 125-acre site. This area is bounded on the east by the Chandler Park baseball diamonds, by the bluffs on the northern side just above Avery Drive and the Arkansas River, and the road through the site to the south. Photograph 1 in Attachment 3 is an aerial view of the site prior to remediation. An overlay provides specific information about the site, the relative location of the cap, and the seep locations.

The topography of the site has been modified by quarrying, landfill, and remediation activities. The road to the south of the remediation area forms a drainage divide, and most of the surface water from Chandler Park flows into one of two draws located in the park area. (See Figure 2.) Therefore, the majority of surface runoff from this site results from precipitation directly upon the site rather than run-on from other areas. Run-off from the remediation area flows in a generally westerly direction to the western portion of the site where the flow is intercepted by a draw of an unnamed tributary of the Arkansas River.

John Mathes and Associates identified two aquifers under the Compass Site during the Remedial Investigation. They consist of a perched aquifer and an unconfined aquifer, and are depicted in an East-West cross-section provided in the Remedial Investigation Report (Figure 3). There is no known use for the water contained in either of these two aquifers.

Subsurface water in the upper (perched) aquifer consisted primarily of water resulting from percolation of precipitation which fell directly upon the site and soaked into the loose fill materials. Additional recharge is probably provided through cracks in the limestone (Hogshooter Formation) adjacent to the site. The underlying shale (Coffeyville Formation) forms the low permeability basal boundary of this aquifer. Outcrops of these formations occur along the northern bluffs, often associated with groundwater seeps.

Table 1

Chronology of Remediation Activities

Early 1983	Air Monitoring by EPA and OSDH after repeated complaints by local residents and the media
Sept. 1983	Compass Industries Site proposed for the NPL
July 1984	EPA and OSDH enter Cooperative Agreement to undertake RI/FS
Sept. 1984	Site listed on NPL
July 1987	Remedial Investigation Report Published
Aug. 1987	Endangerment Assessment
Sept. 1987	Record of Decision
Aug. 1988	Award of Remedial Design Contract
Mar. 1989	Unilateral Administrative Order issued by EPA against 7 PRPs
Apr. 1989	EPA approves Final Design
Jan. 1990	Remedial Action begins with construction of test fill
Oct. 1990	Remedial Action complete, except turfing
June 1991	Remedial Action complete
Aug. 1991	O&M Plan accepted by EPA
Oct. 1993	EPA notifies PRPs of intent to monitor vents and seeps adjacent to cap
My 1995	Submission of First 5 Year Report (Draft), never finalized.

The unconfined aquifer is located 37 to 52 feet below the top of the Coffeyville shale in the Layton Sandstone Formation. Some recharge of this aquifer is believed to be through its overlying shale formation, but, because of the low permeability of the shale, this recharge is believed to be a very small amount. Discharge from this aquifer is again through small seeps in the bluffs on the northwest side.

B. History

The Compass Industries Superfund Site was originally operated as a quarry. Based upon aerial photography, in 1938 the quarry already occupied approximately 44 acres or about 35% of the total 125 acres included in the site today. The Remedial Investigation report states that the limestone at this site was being utilized as early as 1904 for cement-making and railroad ballast and that a crusher was in operation by 1908. Quarrying operations continued into the early 1960s. Aerial photography from 1964 shows that quarrying operations had ceased and waste disposal activities had started. Photographic evidence shows waste disposal and landfill activities continued at the site into the 1980s. The only period during which landfill activities were permitted by the Oklahoma State Department of Health was between 1972 and 1976. The permit allowed the site to be operated as a municipal landfill, but did not allow the disposal of industrial wastes.

Very few records were maintained by the landfill operators concerning the disposal of wastes or cell locations. However, records do show that the site accepted three categories of hazardous wastes: solids, liquids, and sludges, which included acids, caustics, potentially toxic solvents, and potentially carcinogenic materials. Aerial photographs indicate numerous wet areas and pools of liquid. Sequential photographs show apparent overlapping and irregular filling of landfill cells, making delineation of the cells very difficult.

During the 1970s fires began to appear at landfill. These fires continued until 1984. Often these fires were the result of spontaneous combustion of the waste materials and burned underground for extended periods of time. The smoke expelling from the ground during these fires was noticeably multi-colored and produced odors which prompted citizens' complaints. Photographs depicting these conditions are included in Attachment 3.

As a result of these citizens' complaints, monitoring in the vicinity of the site was conducted by the U.S. Environmental Protection Agency and the Oklahoma State Department of Health (OSDH). Based upon this monitoring, the site was proposed to the National Priorities List (NPL) in September 1983 and

listed on the NPL in September 1984. The Hazard Ranking Score (HRS) for the site was 36.57, with the air route of exposure receiving a significantly higher score than either the groundwater or surface water exposure routes.

C. Investigations

During the initial site investigation in November 1983 conducted by several EPA contractors, seven monitoring wells (four shallow and three deep) were installed and a biological investigation was conducted. The wells were sampled in January 1984 and June 1985. During 1983 and 1984, an aerial photographic survey was conducted and approximately 28 borings were installed at the site to extinguish underground fires. These investigations were followed by the Remedial Investigation, which was conducted in 1986.

The Remedial Investigation (RI) was conducted by the Oklahoma State Department of Health with John Mathes and Associates, Inc., as the State's construction contractors. During the RI, eleven additional monitoring wells were installed. Five of these were deep monitoring wells, extending into the Layton Sandstone Formation, while the remaining 6 were shallow wells for monitoring the perched water table. Groundwater samples obtained from the wells, seep water samples obtained from the perimeter bluffs, and surface water samples from drainageways around the perimeter of the landfill were collected and analyzed. Samples were analyzed for inorganic and organic priority pollutants, Total Organic Carbon (TOC), barium, chloride, fluoride, and sulfate. Additionally, samples from the monitoring wells were analyzed for Carbon Oxygen Demand (COD).

Water analyses concentrations of benzene at three surface locations and one seep location varying between 1.5 and 2.2 ug/l, exceeded the toxic substance goal concentration established by the Clean Water Act Water Quality Criteria for drinking water.

Soil samples from the landfill surface, from trenches, and from sediment in drainage ways leaving the site were obtained and analyzed. The waste had high concentrations of priority pollutant metals, volatile organics, and base-neutral organics, but surface samples and sediment samples had much lower concentrations of organic compounds.

Air sampling was conducted during subsurface explorations. This identified a significant concentration of relatively low hazard nuisance gases, but only trace quantities of toxic volatile organic vapors.

D. Legal Description

After the completion of the remediation, the property owner (Jackson) sold the site, by tract, at auction. It was determined that deed restrictions needed to be applied. Because no formal survey of the site had been performed, a meets and bounds survey was conducted in January 1997. This data has been included in Attachment 4. The necessity to have the survey completed was one of the reasons the Five-Year Review report was not finalized in 1995.

The EPA has had deed restrictions incorporated into the deeds for these sites. The EPA has required that no activity occur which may damage the landfill cap.

IV. Remedial Actions

A. Record of Decision (ROD)

Based upon this Remedial Investigation, a Feasibility Study was performed. The preferred alternative for addressing the contamination at Compass was to cap the site and provide on-site ground water treatment. The EPA, after public comment, signed the ROD on September 29, 1987. The salient features of the ROD were:

1) construction of a Resource Conservation and Recovery Act (RCRA) cap over a graded site with diversion of surface water and monitoring of air emissions;

2) treatment of the groundwater, if deemed necessary from monitoring results, after construction of the RCRA cap;

3) restricting site access by installing a fence and posting signs;

4) monitoring the site for 30 years to ensure no significant contamination migrates from the site;

5) providing for additional Remedial Action if significant migration of contaminants occurs.

B. Remedial Activities

The contract for the design of the Remedial Action was awarded to Bechtel Environmental, Inc., in August 1988 by the Oklahoma State Department of Health.

The primary objectives of the Remedial Action were:

1) to prevent direct contact between the contaminated site materials, including soil, leachate, surface waters, and air emissions, and the human and animal population;

2) to prevent the infiltration of precipitation into the waste; and,

3) to divert surface run-on and promote natural drainage of precipitation from the landfill.

The Remedial Action began in January 1990 with the construction of the first test fill. After site mobilization, the contractor installed the leachate collection system as the first item of site work. Then the contractor began grubbing of the heavy vegetation. Following the grubbing, the waste was reshaped by excavating the material from the areas that were high, and filling in the low areas. All materials were compacted to reduce settlement of the cap.

The waste at the perimeter was excavated until a bottom width of 36 inches of clean material was obtained and no waste remained on the exterior slope. Prior to backfilling the trench and covering the waste with impermeable clay material, a gas transmission geotextile was placed directly over the graded waste surface to intercept gases.

The clay material was placed in the trench over the waste and compacted. This was overlain by a geosynthetic liner system, consisting of an impermeable membrane (30 mil nominal thickness HDPE) and a subsurface drainage system. A sandy soil was placed over the drainage system and covered with topsoil and native grasses. (Figure 4).

Construction was considered essentially complete in October 1990. Remaining work at that time consisted of repairing damage which occurred during the first winter and planting native grasses. Both of these items were accomplished in the Spring of 1991.

C. Operation and Maintenance Activities

The O&M Plan includes the following requirements.

1) Water leaving the surface of the landfill and water seeping from the bluffs north of the site (above Avery Drive) shall be sampled quarterly. The approximate location of the seeps are shown on an overlay of the first photograph in Attachment 3.

2) Settlement monuments shall be surveyed at least annually to determine settlement/swell within the landfill.

3) inspect the landfill surface semiannually. Repair cracks, fill voids, and reseed as required.

4) Maintain security of the site, including fencing and signage.

Requirements added during the O&M period included sampling the air vents for the presence of organic gases and sampling a seep adjacent to the cap.

The PRPs contracted with Flint Environmental Services (a division of Flint Engineering & Construction Co.) to operate the site. Flint was responsible for completing the tasks assigned in the O&M Plan. In 1994, Flint Engineering & Construction Co., divested itself of Flint Environmental Services. Mr. J. Scott Stelle, R.E.M., who had been the Project Manager, has operated the site since that time.

V. Five-Year Review Process

The Compass Industries Five-Year Review was led Mr. Shawn Ghose, Remedial Project Manager for the site. Other persons involved in the review included Mr. Richard Smith, COE Project Manager, and Mr. Scott Stelle, O&M Contractor.

The Five-Year Review consisted of reviewing the data (contaminants of concern in the EPA approved O&M plan) gathered from the O&M sampling events against the established criteria, and an inspection of the site.

A draft five-year review report was not finalized in 1995 due to complications arising from the lack of a legal description (in meets and bounds) of the RCRA cap, and the property owner's desire to sell the remediated property.

Also EPA was pursuing recovery of the past costs from the PRPs. After a couple of years the U.S. Department of Justice decided not to pursue the cost recovery action.

VI. Five-Year Review Findings

A. Review of Existing Data

Water Sampling Results

Sampling of the seeps on the bluffs began in February 1992, except for the seep adjacent to the cap which was first sampled in August and September 1991. An additional seep (shown as NS-1 on overlay in Attachment 3) was located adjacent to the landfill along the northern side. This seep was first identified during the summer of 1991. It has been determined that this seep is above and slightly east of Seep Number 5. Because of its close proximity to the cap and its constant wetness, sampling of this location occurred in August/September 1991 and also semiannually since October 1993 when the PRPs were notified that sampling of this seep is required.

Water collecting on the surface of the cap after a significant rain is also collected quarterly, as practical.

Samples have been consistently below the Monitoring Concentration Levels established in the O&M Plan. Tables 2 and 3 provide maximum concentrations for the contaminants of concern. Tables of all water sampling results are provided in Attachment 5.

Settlement

Data which have been provided by the PRPs (Attachment 6) show that movement is occurring at some of the settlement monuments. Movement at individual monuments has been as great as 0.16 ft. (-2 in.) between annual surveys. Most interesting, however, is that the net movement, as shown in Table 4, between the original survey and the current survey is only in excess of 0.10 ft. at one location. Also, there is no apparent correlation between the amount of cut or fill of waste and the cap movement. Settlement amounts of the magnitude indicated are normal for this type of construction and do not pose any problem to the integrity of the cap.

Vent Sampling

The PRPs have sampled the vents monthly since receiving direction from the EPA in October1993. Consistently, several vents have indicated the presence of organic vapors. This indicates that the waste is continuing to off gas and that the venting system is working. The organic vapor concentrations have ranged up to 1,000 ppm measured inside the vent pipes. The organic vapors are probably methane gas from the biodegradation of the waste materials and will not constitute a hazard in the open atmosphere at these levels. The results of the vent sampling with a figure showing the vent location are provided in Attachment 6.

Table 2

Known Contaminants Vs. Surface Water Concentrations

ANALYTE	EPA ANALYTICAL METHOD	DETECTION LIMIT (ppb)	MONITORING CONCENTRATION	MAXIMUM O&M CONCENTRATION	MAXIMUM OVERSIGHT CONCENTRATION
ARSENIC	7060	1	250	12.0	N/A
HEXAVALENT CHROMIUM	7196	100	1,200	BDL	N/A
LEAD	7421	1	340	10.0	N/A
BIS(2-ETHYLHEXYL) PHTHALATE	625	2.5	5,000	22.0	N/A
BENZENE	624	4.4	116	BDL	N/A
POLYCHLORINATED BIPHENYLS (PCBs)	608	0.1	0.1	BDL	N/A
TOTAL ORGANIC CARBON (TOC)	415.1	1,000		23,600	N/A
BIOCHEMICAL OXYGEN DEMAND (BOD)	405.1	1000		31,800	N/A
TOTAL SUSPENDED SOLIDS (TSS)	160.2	5,000		361,000	N/A
pH	150.1	N/A		8.5	N/A

N/A - NOT AVAILABLE BDL - BELOW DETECTION LIMITS

Table 3

Known Contaminants Vs. Seep Water Concentrations

ANALYTE	EPA ANALYTICAL METHOD	DETECTION LIMIT (ppb)	MONITORING CONCENTRATION	MAXIMUM O&M CONCENTRATION	MAXIMUM OVERSIGHT CONCENTRATION
ARSENIC	7060	1	250	5.0	8.0
HEXAVALENT CHROMIUM	7196	100	1,200	BDL	110.0
LEAD	7421	1	340	6.0	5.0
BIS (2-ETHYLHEXYL) PHTHALATE	625	2.5	5,000	426.0	26.6
BENZENE	624	4.4	116	BDL	BDL
POLYCHLORINATED BIPHENYLS (PCBs)	608	0.1	0.1	BDL	BDL
TOTAL ORGANIC CARBON (TOC)	415.1	1,000		29,000	23,300
BIOCHEMICAL OXYGEN DEMAND (BOD)	405.1	1,000		13,000	3,000
TOTAL SUSPENDED SOLIDS (TSS)	160.2	5,000		49,000	87,000
PH	150.1	N/A		8.7	N/A

N/A - NOT AVAILABLE BDL - BELOW DETECTION LIMITS

b. Site Inspection

Inspection of the Cap

The vegetative cover is well established. The site is covered with native grasses except in the main swale where bermuda grass was planted to control the erosion. The bermuda grass has continued to thrive in spite of no maintenance. The native grasses are beginning to naturally seed this area and mix with the bermuda grasses. The vegetative cover is holding the soil in place, as there is no new erosion sites and the prior erosion sites have been repaired.

The drainage system appears to be working properly. Wet areas at the west end commonly remain after most other areas have dried. Initially, it was suspected that this may be seepage from the landfill, but monitoring over several years has shown cyclic wetting and drying. The wet areas dry after a prolonged dry spell and do not reappear until after a wet period has occurred with suitable time for the water to infiltrate the soil and pass through the drainage system. Also, the riprap at the west end remains in good condition.

Security

There is no evidence of continued or long-term use of the site, although evidence that unauthorized persons have been on the site has been noted. The evidence includes theft of warning signs and broken gates and fences. Other vandalism or damage to the cap has not occurred.

Table 4

Monitored Landfill Cap Movement

Monument		Top of Waste Elev. (Approx.) (Feet)			Settlement Monuments Elev. (Monitored Annually)			
	Location	Original	Final	Fill (Cut)	Original Oct-90	Latest Jul-94	Deviations	
							Total	Maximum
No. 1	N 415,100 E 2,567,200	858.5	857.5	(1.0)	860.74	860.73	(0.01)	0.02
No. 2	N 416,000 E 2,567,000	841.9	845.0	3.1	847.58	847.47	(0.11)	0.08
No. 3	N 415,600 E 2,566,600	842.2	844.0	1.8	846.15	846.09	(0.06)	(0.16)
No. 4	N 416,400 E 2,566,600	826.1	829.8	3.7	832.54	832.58	0.04	0.12
No. 5	N 416,100 E 2,566,000	816.6	819.7	3.1	822.40	822.44	0.04	0.13
No. 6	N 415,600 E 2,567,000	819.7	818.5	(1.2)	823.34	823.34	0.00	0.13

VII. Assessment

Question A: is the remedy functioning as intended by the decision documents?

- **Construction of a RCRA cap over a graded site with diversion of surface water:**
  The RCRA cap was determined to be in proper working order during the inspection. The flow of water through the seeps has been determined to be decreasing, indicating that surface water is not percolating into the waste.

- **Treatment of the groundwater, if necessary:** No contaminants above the thresholds established in the O&M plan have been identified. Therefore, there is no need for a treatment system because the cap is providing adequate protectiveness of the groundwater.

- **Restricting site access by installing a fence and installing warning signs:** The fence and warning signs have been installed. Because the site is located several hundred yards from any populated area and is used for recreational purposes by children and young adults for activities such as dirt bike riding, some trespassing does occur. However, the vandalism has been limited to stealing signs and breaking through the fence to ride. This vandalism does not endanger the remedy or the trespassers/vandals.

- **Monitoring the site for 30 years to ensure no significant contamination migrates from the site:** The data reviewed in conjunction with this five-year review indicate that the site is being monitored on a regular basis and that there is no migration of contaminants from the site.

Question B: Are the assumptions used at the time of the remedy selection still valid?

- **Changes in Standards:** No change of the contaminants of concern or ARARs were identified during this review, which would affect the remedy selection. The maximum contaminant levels were established in the O&M Plan for this specific site.

- **Changes in exposure pathways:** No changes have been noted because there have been no changes in land use around this site.

Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No additional information has been identified that would call into question the protectiveness of the remedy.

VIII. Deficiencies

No deficiencies were noted during the Five-Year review, as the data were adequate and the site inspection revealed no major deficiencies. Several potential deficiencies were identified during the inspection. These included

a) continued mowing of the native grasses may result in a buildup of thatch; therefore if mowing continues the site should be raked approximately every four years.

b) as the area returns to native vegetation, woody plants with strong root systems may damage the liner system; therefore, remove woody vegetation should be removed at least annually.

c) burrowing animals including mice, rats, and snakes may also damage the liner system; therefore continued periodic checks on the site should be maintained; and,

d) erosion of the protective soil continues to be a concern, and the site should be periodically inspected to ensure that the full 24 inches remains intact.

IX. Recommendations and Follow-up Actions

The O&M contractor was reminded to be continually aware of the potential deficiencies identified and to be vigilant about making the repairs. Under the requirements of the ROD, the PRPs are responsible for monitoring and maintaining the site for a period of at least 30 years.

X. Statement of Protectiveness

Because the remedial action is expected to be protective, the remedy for the site is expected to be protective of human health and the environment. Based upon the site inspections, the sampling results, and the survey results, the remedial

actions are performing well. The RCRA Cap system has been well maintained and now is performing its function with minimal maintenance and movement. The groundwater leaving the site, when present, has been substantially below the monitoring concentrations, never having exceeded 10% of any level. The site appurtenant structures, including the fencing, the signs, and the vent pipes, are in sound condition with no signs of physical deterioration. All contaminants of concern appear to be fully controlled by the RCRA Cap.

XI. Next Five-Year Review

The next Five-Year Review will be conducted during FY 2001. The results of this review support the view that the scope of the next Five-Year Review should be limited to an inspection of the RCRA Cap System and the appurtenant structures to ascertain that they are not being damaged by animals or the elements and that vandalism of the site is controlled.

XII. Other Comments

The processes to delete this site from the NPL should be investigated as the remedy has proved to be protective of human health and the environment. The site may be separated into two distinct areas

1) the capped portion of the site where waste remains; and,

2) the remaining portion of the site which does not have waste.

The latter area may be deleted without restriction. The capped area should be evaluated to determine if it meets the requirements of 40 CFR 300.425(e)(1). Contingent upon meeting those requirements, the deletion should include institutional controls to maintain the integrity of the cap.

Attachment 1

Documents Reviewed

Agency for Toxic Substances and Disease Registry, (U.S. Department of Health and Human Services), Compass Industries (Avery Drive), Tulsa, Tulsa County, OK, **Site Review and Update**, December 16, 1993 (Revised).

Bechtel Environmental, Inc., **Final Design Report** for Remedial Action, Compass Industries Superfund Site, March, 1989 (Prepared for the Oklahoma State Department of Health, EPA Cooperative Agreement No. V-006459-01-0).

Bechtel Environmental, Inc., Specifications and Bidding Documents for Remedial Action, Compass Industries Superfund Site, March, 1989 (Prepared for the Oklahoma State Department of Health, Contains **Scope of Work, Quality Assurance Project Plan and Site Safety Plan).**

Bechtel Environmental, Inc., **Remedial Action Report**, for the Compass Industries Superfund Site, January 1991.

Bechtel Environmental, Inc., **Post Closure Operations and Maintenance Plan** for the Compass Industries Superfund Site, August 1991 (Revised by letters dated February 21, 1992 and October 6, 1993).

Camrud, M. J., Compass Industries Superfund Site, **Unpublished Paper**, July 17, 1994.

Environmental Protection Agency, Compass Industries Landfill, Tulsa County, OK, **Record of Decision**, September 29, 1987.

Environmental Protection Agency, Compass Industries Site, Tulsa County, OK, **First Amended Administrative Order**, May 31, 1989.

Environmental Protection Agency, **Close Out Report**, Compass Industries Landfill Superfund Site, Tulsa County, OK, June 30, 1992.

Flint Environmental Services (A Division of Flint Engineering & Construction Co.), **1992 Annual Monitoring Report**, Compass Industries Site, January 29, 1993.

Flint Environmental Services (A Division of Flint Engineering & Construction Co.), **1993 Annual Monitoring Report**, Compass Industries Site, January 18, 1994.

Lockheed Engineering and Management Services Company, Inc., **Aerial Photographic Analysis of Compass Industries Landfill**, Tulsa, OK, August 1984.

John Mathes & Associates, Inc., **Remedial Investigation Report**, Compass Industries Landfill, Superfund Site, Tulsa County, Volume 1, July 13, 1987. (Prepared for the Oklahoma State Department of Health).

John Mathes & Associates, Inc., **Feasibility Study Report**, Compass Industries Landfill, Superfund Site, Tulsa County, July 13, 1987. (Prepared for the Oklahoma State Department of Health).

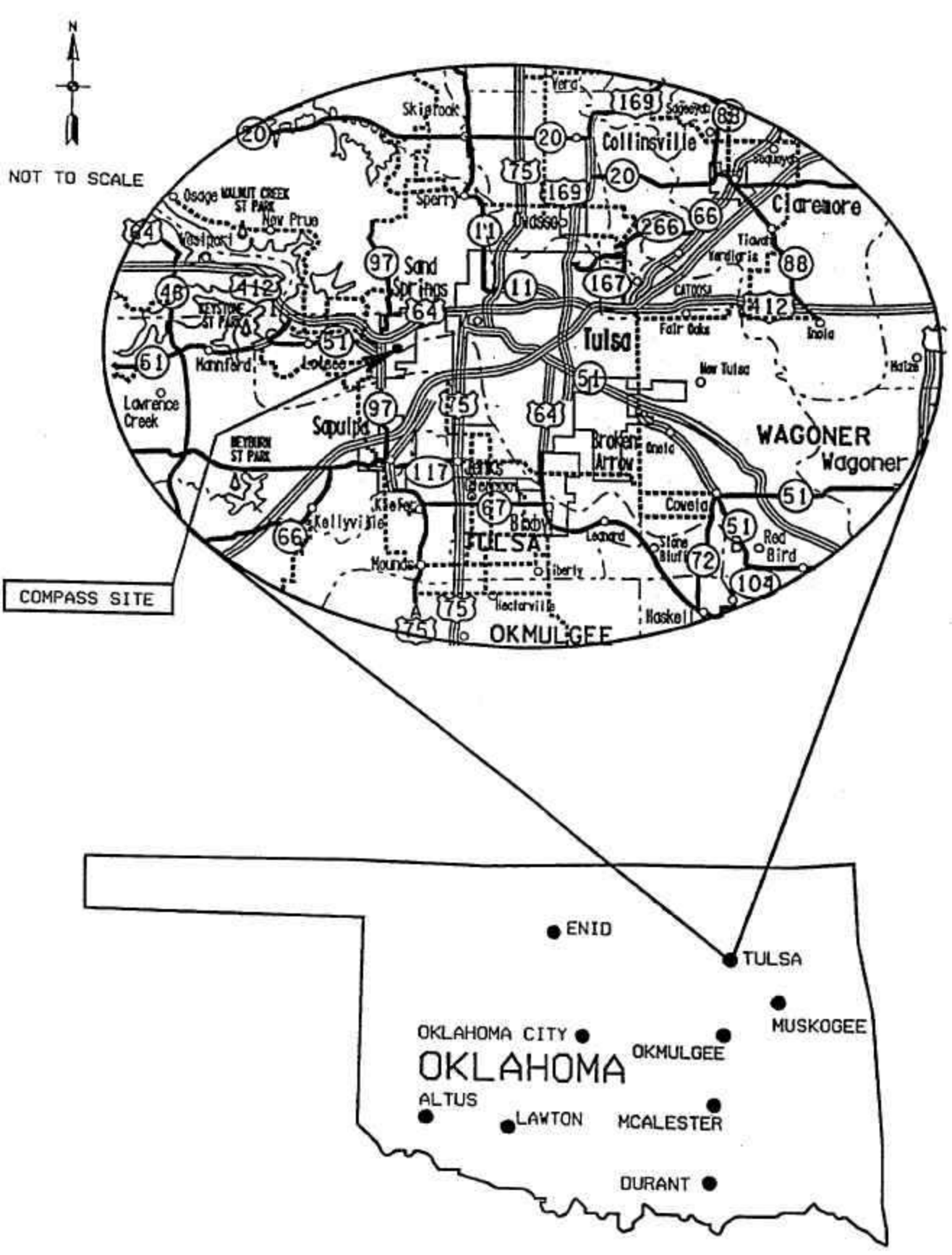
John Mathes & Associates, Inc., **Endangerment Assessment**, Compass Industries Landfill, Superfund Site, Tulsa County, August 10, 1987. (Prepared for the Oklahoma State Department of Health).

J. Scott Stelle, R.E.M., **1994 Annual Monitoring Report,** Compass Industries Site, December 30, 1994.

U.S. Army Corp of Engineers, Tulsa District, **Quality Assurance Final Report**, Compass Industries Superfund Site, Volumes I, II, and III, January, 1991.

Attachment 2

Figures



LOCATION MAP
COMPASS INDUSTRIES SUPERFUND SITE
TULSA COUNTY, OKLAHOMA

FIGURE 1

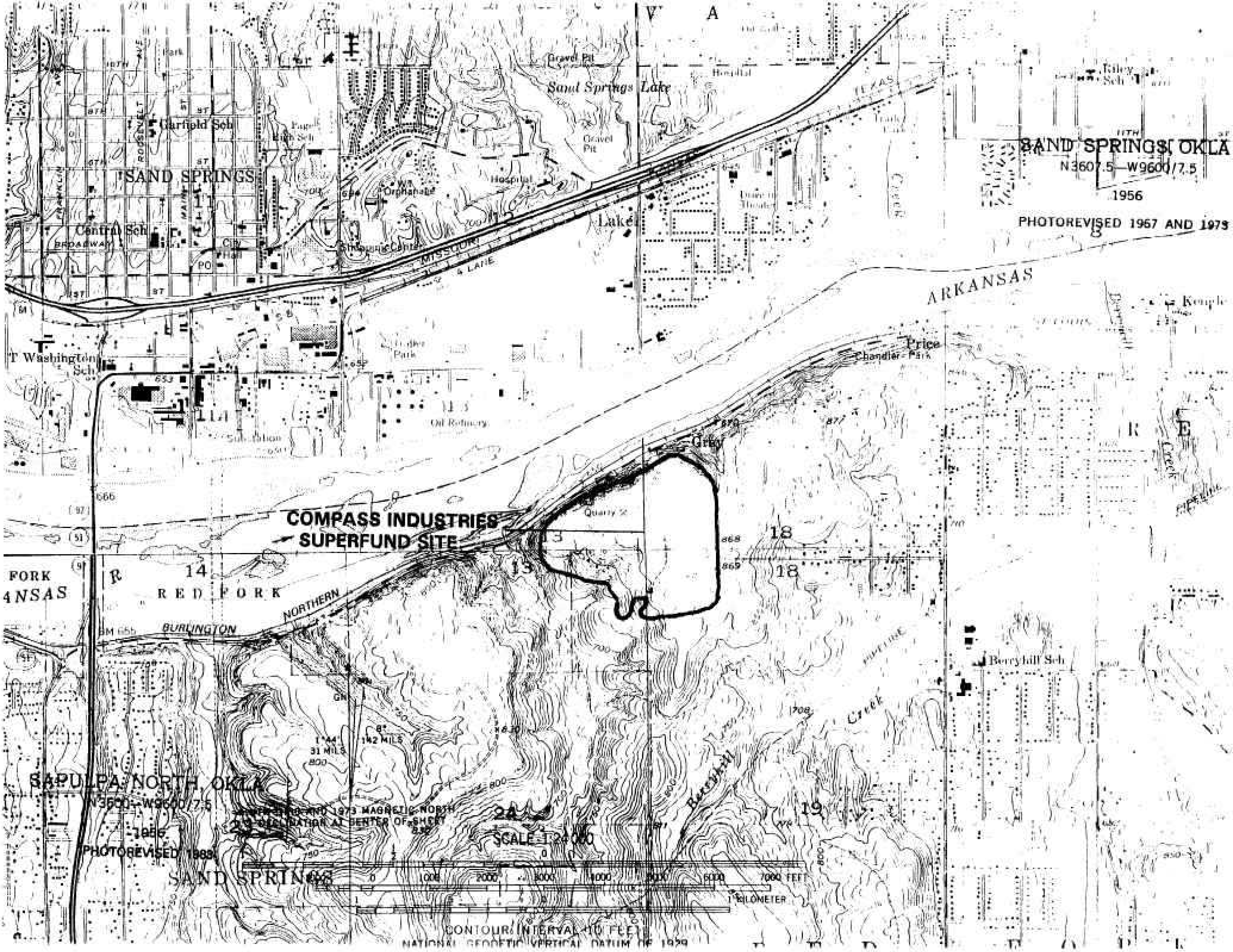
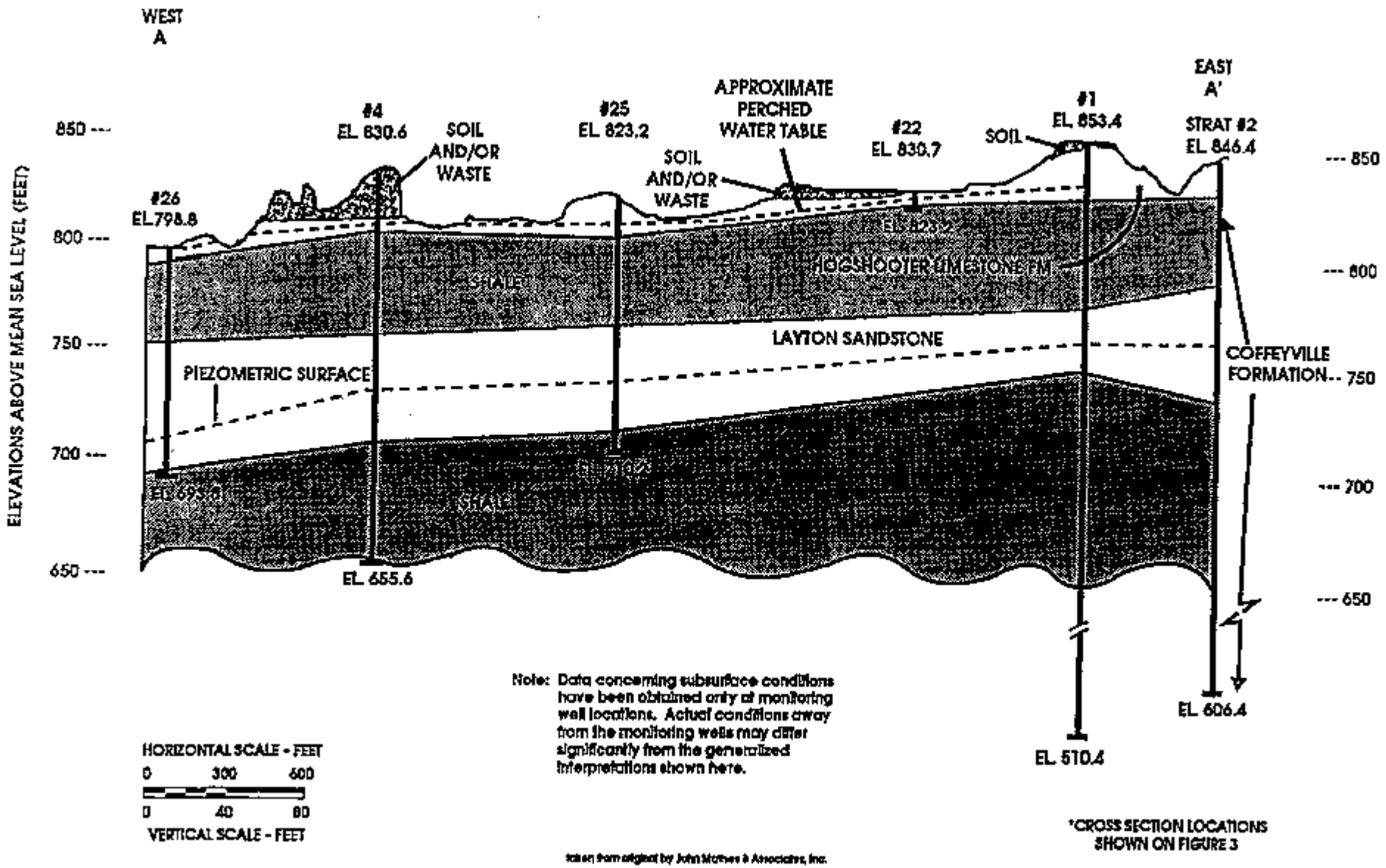

SAND SPRINGS, OKLA
N3607.5—W9600/7.5
1956
PHOTOREVISED 1967 AND 1973
COMPASS INDUSTRIES
SUPERFUND SITE
SAND SPRINGS
Garfield Sch
Central Sch
Sand Springs Lake
Gravel Pit
Hospital
Oil Refinery
ARKANSAS
Chandler Park
Berryhill Sch
RED FORK
BURLINGTON
NORTHERN
MISSOURI
TEXAS
SAPULPA NORTH, OKLA
N3600—W9600/7.5
1956
SCALE 1:24000
1000 2000 3000 4000 5000 6000 7000 FEET
1 KILOMETER
CONTOUR INTERVAL 10 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

FIGURE 3 - GEOLOGIC CROSS-SECTION



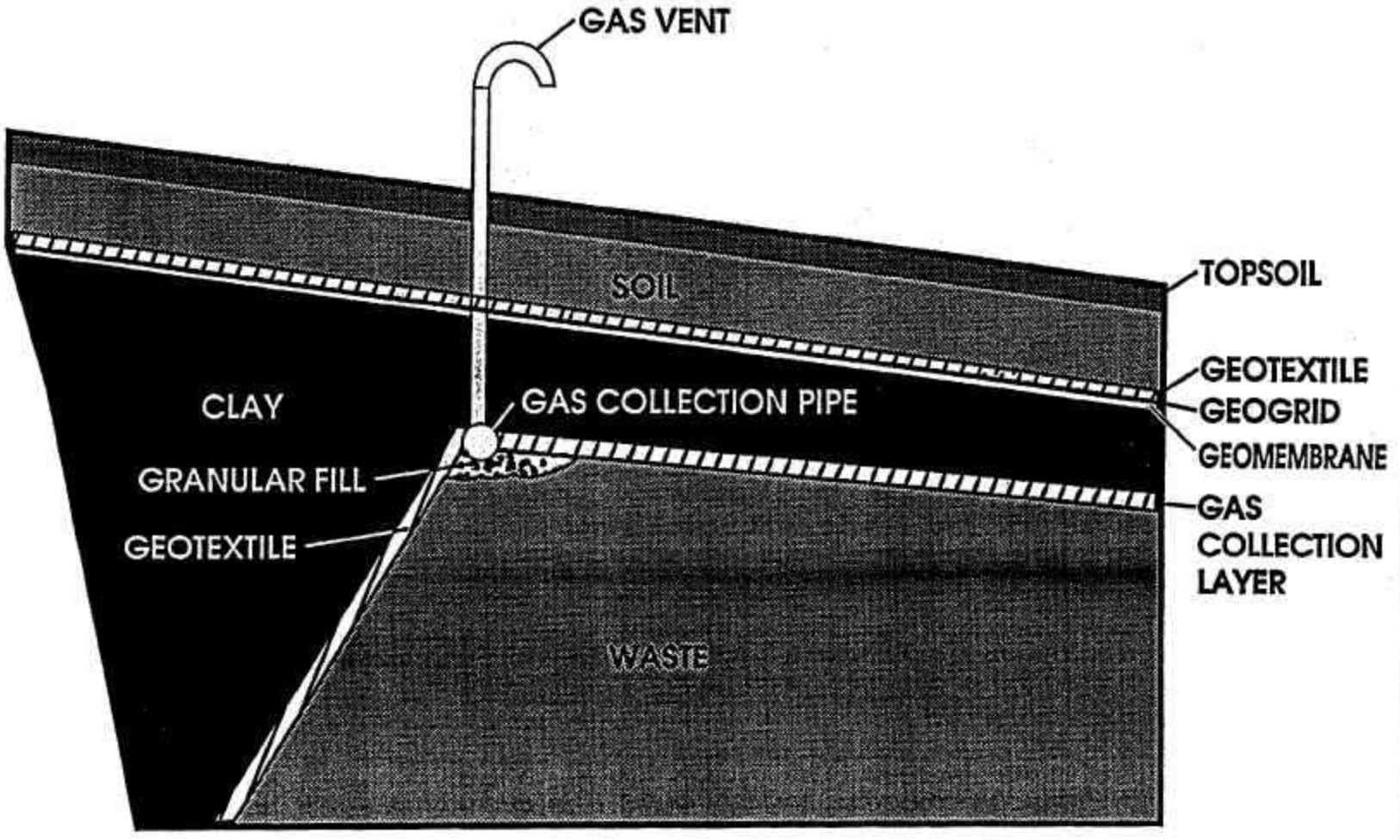


FIGURE 4

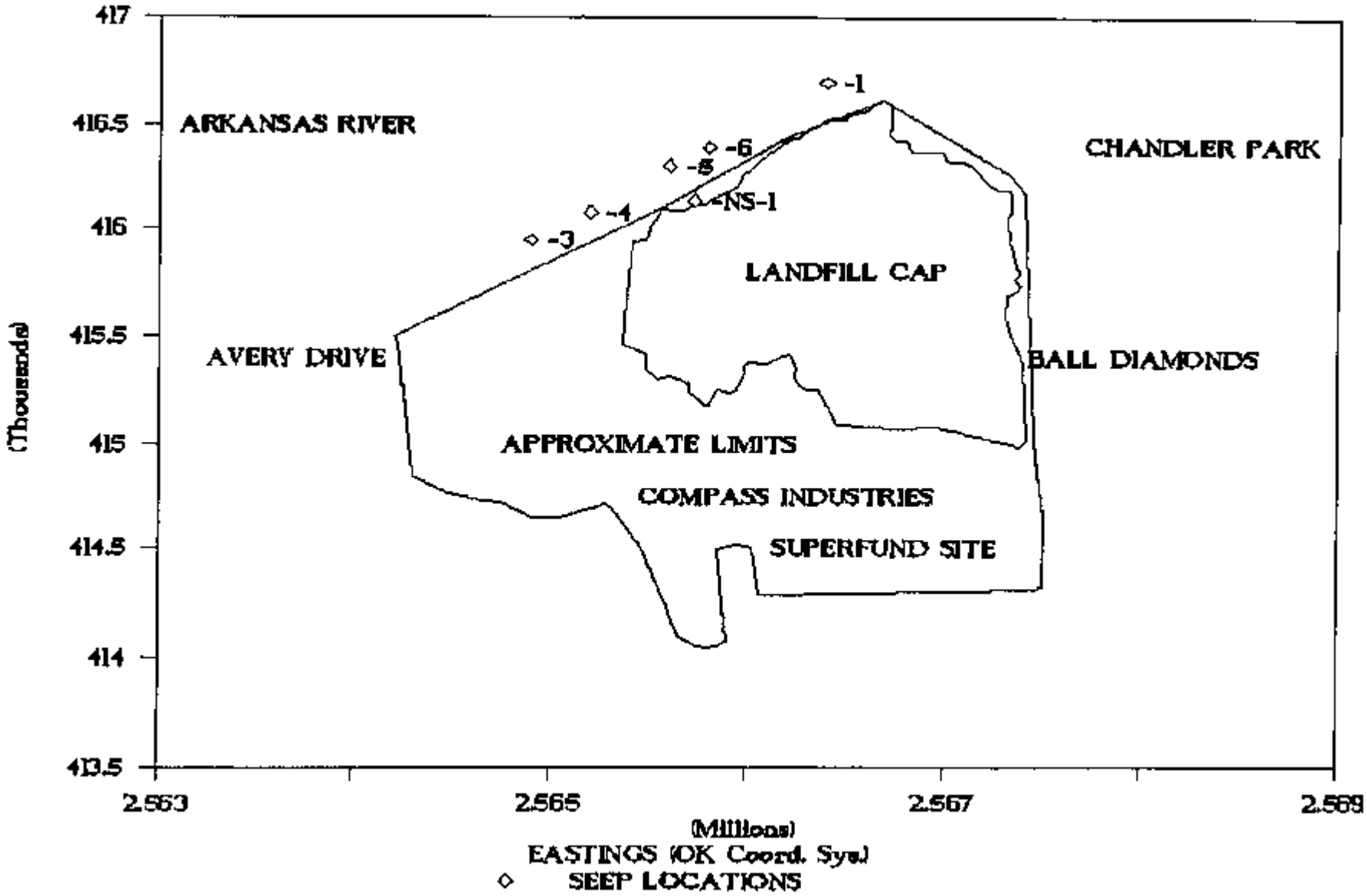
COMPASS INDUSTRIES SUPERFUND SITE
COMPOSITE CAP AND GAS COLLECTION SYSTEM

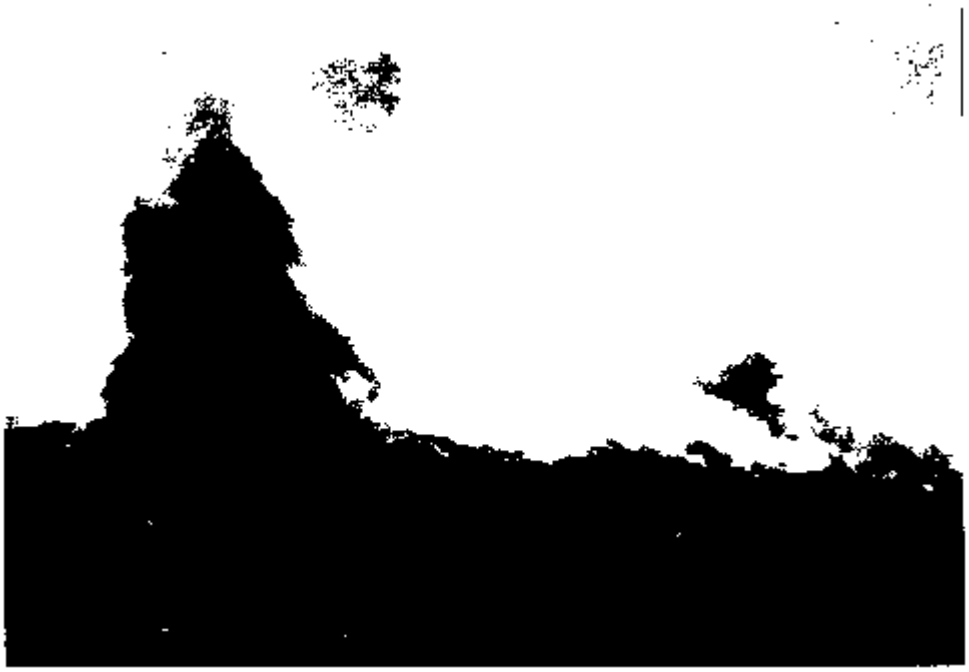
Attachment 3

Photographs

COMPASS INDUSTRIES SUPERFUND SITE

Aerial Photo Prior To Remediation

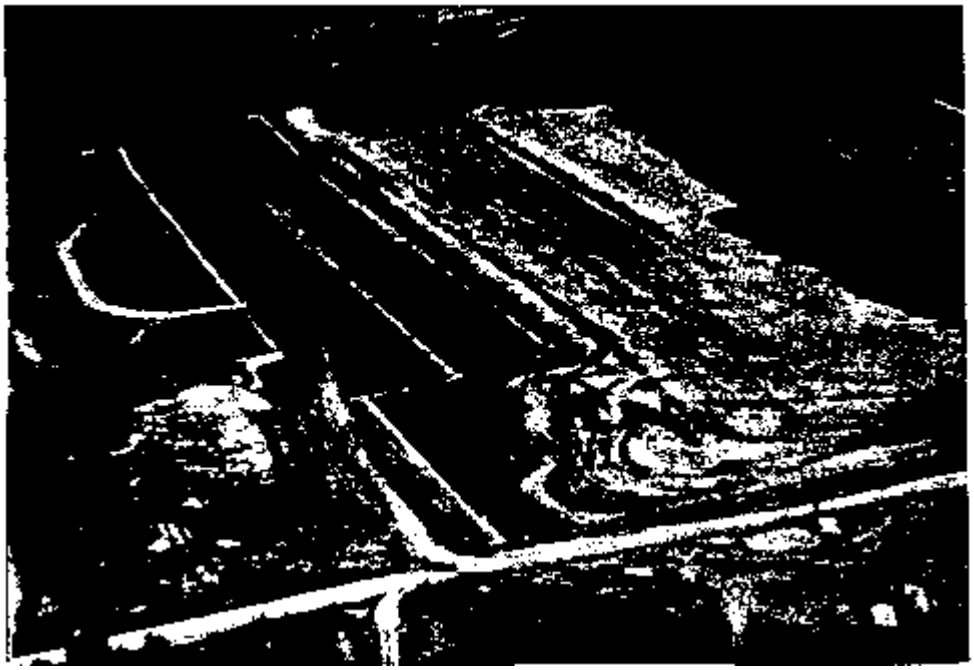




Photograph showing fires and multicolored plumes of smoke at the Compass Site (circa 1980)

Photograph showing smoke from underground fires at the Compass Site (circa 1980)

Reshaping the waste during remediation

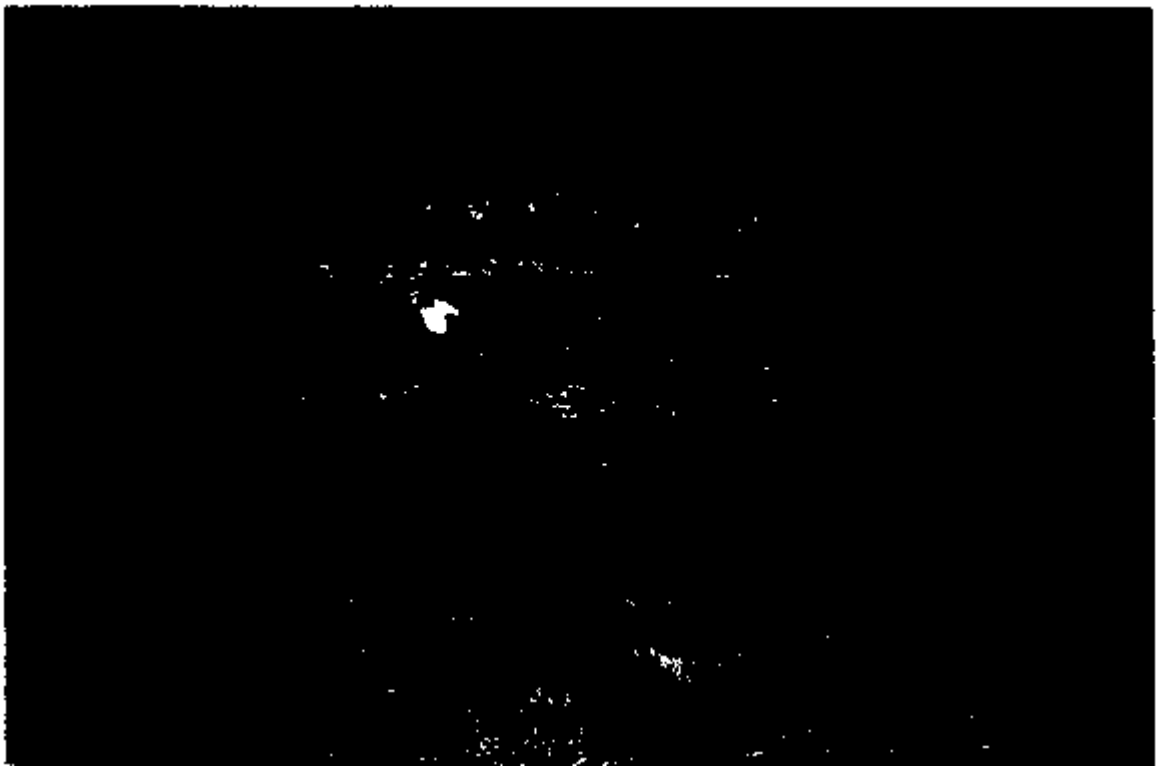


Aerial view during remediation showing (left to right) graded waste, gas transmission layer, clay, liner system (geomembrane, geonet, and geotextile), soil fill, and topsoil.

Placement of gas transmission system
during construction.

Typical surface vent.

EPA Project Manager, Shawn Ghose, and O&M Contractor, Scott Stelle discuss a recent slope repair during the 1994 Walkover Inspection.



Recently mowed cap allows easy visual inspection. Additional fill has been placed in an eroded area.

Looking northwesterly across cap. North slope seep is located just below the cap between these rock outcrops.

Runoff from cap through the liner system and out the toe of the cap.

Typical seep sampling equipment -.
Stainless steel collector and glass jar

North slope seep collection sump

0&M Contractor obtaining seep sample.

O&M Contractors collect surface samples after a rainfall.

Attachment 4

Legal Description and Plat

LEGAL DESCRIPTION OF COMPASS LANDFILL

IN CONJUNCTION WITH CORPS OF ENGINEERS CONTRACT NO. DACA56-96-0005 - MODIFICATION NO. 00021 TO DELIVERY ORDER NO. 0002.

TABLE FORMAT:

POINT	SITE GRID BEARING	DISTANCE	CODE
130			ARCHIVED POS.
	S 01°20'42" E	506.19	
109			MON. ALUM. CAP
	S 75°41'56" W	338.55	
123			MON. ALUM. CAP
	N 56°03'38" W	461.97	
110			MON. ALUM. CAP
	N 66°38'30" W	400.87	
111			MON. ALUM. CAP
	N 30°08'07" E	852.76	
112			MON. ALUM. CAP
	N 75°04'33" E	413.94	
113			MON. ALUM. CAP
	N 57°54'24" E	260.80	
122			MON. ALUM. CAP
	N 57°54'24" E	541.82	
114			MON. ALUM. CAP
	S 87°16'30" E	280.30	
115			MON. ALUM. CAP
	S 53°24'53" E	820.39	
116			P.K. NAIL/ROCK
	S 01°15'08" E	570.38	
100			MON. ALUM. CAP
	S 00°57'03" E	637.53	
101			MON. ALUM. CAP
	S 88°51'57" W	104.41	
102			MON. ALUM. CAP
	N 82°56'59" W	158.34	
103			MON. ALUM. CAP
	N 79°47'18" W	369.74	
104			MON. ALUM. CAP
	N 83°12'19" W	178.28	
105			MON. ALUM. CAP
	N 88°18'15" W	290.14	
106			MON. ALUM. CAP
	N 89°48'50" W	131.95	
107			MON. ALUM. CAP
	S 88°16'28" W	134.71	
108			MON. ALUM. CAP
	S 84°59'29" W	31.59	
109			MON. ALUM. CAP

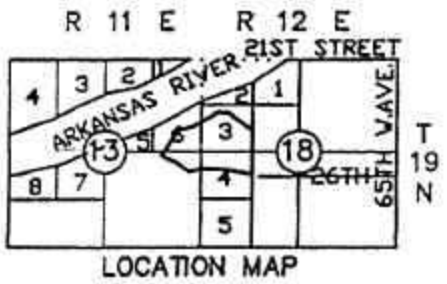
ARK BASIN INC.
d.b.a.
BREISCH AND ASSOCIATES
SURVEYORS, ENGINEERS, PLANNERS
30 SOUTH MAIN SAND SPRINGS, OKLAHOMA 74063
PH (918) 245-8702 FAX (918) 245-9563
CA # 1851 (EXPIRES 06-30-97)

SKETCH PLAT OF JACKSON TRACTS & COMPASS LANDFILL

IN CONJUNCTION WITH CORPS OF ENGINEERS CONTRACT NO. DACA56-96-0005 – MODIFICATION NO. 00021 TO DELIVERY ORDER NO. 0002.

SPECIAL NOTE: FOR TRACTS SOLD AT PUBLIC AUCTION APPROXIMATE TRACT LIMITS BOUNDARY LINES (AS DEPICTED IN WILLIAMS & WILLIAMS REALTORS HANDOUT FOR LAND AUCTION HELD MON., AUGUST 21ST, 1995 – ENTITLED "JACKSON TRACTS (BY NUMBER)}

JACKSON TRACT BOUNDARY..... ----------



SCALE: 1" = 400'

ARK BASIN INC.
d.b.a.
BREISCH AND ASSOCIATES
SURVEYORS, ENGINEERS, PLANNERS
30 SOUTH MAIN SAND SPRINGS, OKLAHOMA 74063
PH (918) 245-8702 FAX (918) 245-9563
CA # 1851 (EXPIRES 06-30-97)

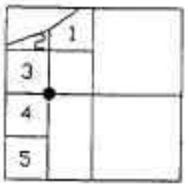
OKLAHOMA CERTIFIED CORNER RECORD

____ Existing ____ Obliterated ____ Lost

C.M. Document No. _____

CORNER DESCRIPTION:

● CORNER MONUMENT



NE Corner of Section 18–LOT 4 Township 19 N Range 12 E

Meridian IBM County TULSA

DESCRIPTION OF ORIGINAL MONUMENT AND ACCESSORIES AND ANY SUBSEQUENT RESTORATION: (Give Sources of Information)

CORNER IS THE NE CORNER OF GOV'T LOT 4, SEC. 18 T19N, R12E
NOT SET IN ORIGINAL GOVERNMENT SURVEY

DEPT. OF LIBRARIES – GLO NOTES

MONUMENT DESCRIPTION:

Description of Corner Evidence Found:

NOTHING

Description of Corner Evidence Set:

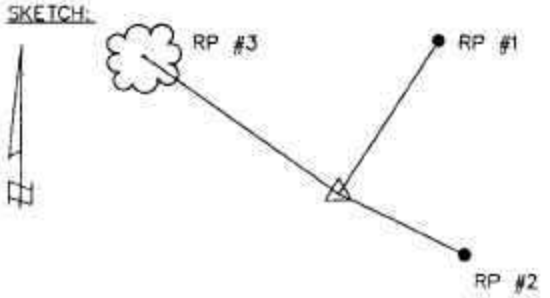
ALUMINUM CAP SET ON TOP OF 5/8" REBAR AND SET IN CONCRETE – STAMPED:

ACCESSORIES ADDED BELOW

REFERENCE MEASUREMENT (At least Three) DESCRIPTION	Distance Feet or Meters	BEARING True ☐ Magnetic ☒
1. FOUND 40D NAIL IN SW SIDE L.P.	73.15	N 19° E
2. FOUND 40D NAIL IN NW SIDE L.P.	121.59	S 70° E
3. SET 40D NAIL IN EAST SIDE 18" COTTONWOOD	90.06	N 59° W

STATEMENT OF METHOD USED TO DETERMINE CORNER LOCATION: (Lost Corners Only)
SET AT PRORATED GOVERNMENT DISTANCE (ON LINE) BETWEEN CONTROLLING SECTION CORNERS.

SKETCH:



SURVEYORS CERTIFICATION: This is to certify that the monuments and accessories indicated above are correctly described and shown. I further certify that the corner records were checked for any filings prior to making this survey.

Signature

BREISCH AND ASSOCIATES
Firm

30 SOUTH MAIN
Street Address/Post Office Box

SAND SPRINGS, OKLA. 74063
City, State, and Zip Code

1/31/97 1024
Date and Registration Number

OKLAHOMA STATE PLANE COORDINATES: (If Determined)

X: _____ Y: _____ ZONE: _____

Accepted and Filed: _____
Archivist, Archives & Records Division
Oklahoma Department of Libraries
200 Northeast 18th Street
Date: _____ Oklahoma City, Oklahoma 73105

SEAL:

Adopted 12/1/78

Attachment 5

Water Sample Data

Oversight Seep Samples

COMPASS INDUSTRIES SUPERFUND SITE
5 YEAR ANALYTICAL SUMMARY
OVERSIGHT TESTS

SITE	ARSENIC ppb				CHROMIUM VI ppb				LEAD ppb				BIS (2 EHTYLHEXYL) PHTHALATE				BENZENE ppb			
Quarter	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH
1991																				
NS-1			6.0				BDL				BDL				BDL				BDL	
1992																				
SEEP 6		BDL								BDL				26.6				BDL		
SEEP 2			BDL				BDL				BDL				10.6				BDL	
SEEP 5				2.3				BDL				BDL				BDL				BDL
1993																				
SEEP 4		2.0				110.0				5.0				BDL				BDL		
SEEP 4			BDL								BDL				BDL				BDL	
SEEP 5				8.0				20.0				BDL				BDL				BDL
1994																				
NS-1		BDL				9.0				BDL				4.2				BDL		
NS-1			2.2				BDL				BDL				3.2				BDL	
1995																				
SEEP 5	BDL				BDL				2.8				BDL				BDL			
NS-1	BDL				BDL				BDL				BDL				BDL			

COMPASS INDUSTRIES SUPERFUND SITE
5 YEAR ANALYTICAL SUMMARY
OVERSIGHT TESTS

SITE	POLYCHLORINATED BIPHENYLS (PCB) ppb				TOTAL ORGANIC CARBON (TOC) ppm				BIOCHEMICAL OXYGEN DEMAND (BOD) ppm				TOTAL SUSPENDED SOLIDS ppm			
Quarter	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH	1ST	2ND	3RD	4TH
1991																
NS-1			BDL				14.0				<1.0				19.0	
1992																
SEEP 6		BDL				4.9				<1.0						
SEEP 2			BDL				1.8				<1.0				BDL	
SEEP 5				BDL				8.0				1.65				1.0
1993																
SEEP 4		BDL				7.8								87.0		
SEEP 4			BDL				7.3								5.0	
SEEP 5				BDL				BDL				<2.0				4.0
1994																
NS-1		BDL				BDL				<2.0				2.0		
NS-1			BDL				23.3				3.0				4.0	
1995																
SEEP 5	BDL				13.0				<2.0				BDL			
NS-1	BDL				15.7				<2.0				BDL			

O&M Seep Samples

Compass Site O&M Seep Sample Results										
ANALYTE	pH	TSS	ARSENIC	LEAD	BOD	TOC	PCB's	BENZENE	Bis(2 ethylhexyl) phthalate	Hexavalent Chromium
UNITS		mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	mg/l
DETECTION LIMIT		5.0	0.001	0.001	1.0	1.0	0.1	4.4	2.5	0.5
4 February 1992										
2	8.0	6.0	BDL	BDL		2.0	BDL	BDL	BDL	BDL
3	8.1	BDL	BDL	BDL		9.0	BDL	BDL	BDL	BDL
4	8.3	5.0	BDL	BDL		11.0	BDL	BDL	BDL	BDL
5	8.1	49.0	0.002	BDL		12.0	BDL	BDL	BDL	BDL
6	8.1	BDL	BDL	BDL		8.0	BDL	BDL	BDL	BDL
7			BDL	BDL				BDL		
29 Aril 1992										
2	8.5	7.0	BDL	BDL	4.0	12.0	BDL	BDL	BDL	BDL
5 May 1992										
2	8.4	BDL	BDL	BDL	BDL	2.0	BDL	BDL		_BDL
3	8.3	9.0	BDL	BDL	BDL	6.0	BDL	BDL	5.4	BDI
5	8.3	6.0	0.002	BDL	2.0	12.0	BDL	BDL	8.9	BDL
6	8.4	8.0	BDL	BDL	2.0	2.0	BDL	BDL	8.2	BDL
20 July 1992										
2	8.1	BDL	BDL	BDL	2.0	3.0	BDL	BDL	BDL	BDL
3	8.4	BDL	0.001	BDL	13.0	6.0	BDL	BDL	27.3	BDL
5	8.4	BDL	0.003	BDL	4.0	13.0	BDL	BDL	426.0	BDL
7	8.2	7.0	BDL	BDL	12.0	2.0	BDL	BDL	BDL	BDL
1 October 1992										
2	8.4	BDL	BDL	BDL	BDL	3.0	BDL	BDL	BDL	BDL
5	8.1	BDL	BDL	BDL	1.0	14	BDL	BDL	4.9	BDL

Compass Site O&M Seep Sample Results

ANALYTE	pH	TSS	ARSENIC	LEAD	BOD	TOC	PCB's	BENZENE	Bis(2-ethylhexly) phthalate	Hexavalent Chromium
UNITS		mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	mg/l
DETECTION LIMIT		5.0	0.001	0.001	1.0	1.0	0.1	4.4	2.5	0.5
27 January 1993										
1	8.0	BDL	BDL	BDL	2.0	7.0	BDL	BDL	BDL	BDL
2	8.4	BDL	BDL	BDL	3.0	6.0	BDL	BDL	BDL	BDL
3	8.0	BDL	BDL	BDL	3.0	9.0	BDL	BDL	BDL	BDL
4	8.2	BDL	BDL	BDL	2.0	10.0	BDL	BDL	BDL	BDL
5	8.1	BDL	0.002	BDL	1.0	11.0	BDL	BDL	BDL	BDL
6	7.7	BDL	BDL	BDL	2.0	8.0	BDL	BDL	BDL	BDL
7	8.4	BDL	BDL	BDL	2.0	4.0	BDL	BDL	BDL	BDL
27 April 1993										
1	8.2	BDL	BDL	BDL	2.0	7.0	BDL	BDL	10.5	BDL
3	8.7	6.0	BDL	BDL	1.0	7.0	BDL	BDL	6.9	BDL
4	8.5	29.0	BDL	BDL	2.0	9.0	BDL	BDL	10.7	BDL
5	8.5	BDL	0.002	BDL	2.0	11.0	BDL	BDL	8.4	BDL
6	8.2	8.0	BDL	BDL	2.0	29.0	BDL	BDL	10	BDL
17 September 1993										
2	7.8	BDL	BDL	BDL	3.0	5.0	BDL	BDL	BDL	BDL
3	7.9	BDL	BDL	BDL	BDL	5.0	BDL	BDL	BDL	BDL
4	7.7	BDL	BDL	BDL	2.0	10.0	BDL	BDL	BDL	BDL
5	7.9	BDL	BDL	BDL	2.0	14.0	BDL	BDL	BDL	BDL
25 October 1993										
3	7.8	BDL	0.002	BDL	3.0	6.0	BDL	BDL	BDL	BDL
4	8.2	BDL	0.004	BDL	2.0	13.0	BDL	BDL	BDL	BDL
5	8.4	BDL	0.005	BDL	3.0	14.0	BDL	BDL	BDL	BDL

Compass Site O&M Seep Sample Results										
ANALYTE	pH	TSS	ARSENIC	LEAD	BOD	TOC	PCB's	BENZENE	Bis(2-ethylhexyl) phthalate	Hexavalent Chromium
UNITS		mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	mg/l
DETECTION LIMIT		5.0	0.001	0.001	1.0	1.0	0.1	4.4	2.5	0.5
7 March 1994										
1	8.1	10.0	BDL	BDL	BDL	9	BDL	BDL	BDL	BDL
3	8.4	2.0	BDL	BDL	BDL	9.8	BDL	BDL	BDL	BDL
4	8.2	4.0	BDL	BDL	BDL	8.1	BDL	BDL	BDL	BDL
5	8.1	10.0	BDL	BDL	6.7	12.4	BDL	BDL	BDL	BDL
6	7.8	BDL	BDL	BDL	BDL	7.3	BDL	BDL	BDL	BDL
14 June 1994										
1										
3	7.9	36.0	BDL	0.004	10.0	8.6		BDL		BDL
4										
5	8.2	13.0	BDL	BDL	BDL	10.8	BDL	BDL	BDL	BDL
6	8.0	21.0	BDL	BDL	BDL	6.4	BDL	BDL	BDL	BDL
16 August 1994										
1										
3										
4										
5	8.3	38.0	BDL	0.006	8.9	14.9	BDL	BDL	BDL	BDL
6										
13 December 1994										
1										
3	8.0	4.0	BDL	BDL	10.1	7.7	BDL	BDL	BDL	BDL
4	7.9	2.0	BDL	BDL	4.3	9.7	BDL	BDL	BDL	BDL
5	7.8	26.0	BDL	BDL	7.8	13.0	BDL	BDL	BDL	BDL
6	7.8	10.0	BDL	BDL	8.0	7.7	BDL	BDL	BDL	BDL

O&M Surface Samples

Compass Site O&M Surface Sample Results										
ANALYTE	pH	TSS	ARSENIC	LEAD	BOD	TOC	PCB's	BENZENE	Bis (2-ethylhexyl) phthalate	Hexavalent Chromium
UNITS		mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	mg/l
DETECTION LIMIT		5.0	0.001	0.001	1.0	1.0	0.1	4.4	2.5	0.5
11 February 1992										
1	8.0	42.0	BDL	BDL	8.0	18.0	BDL	BDL	BDL	BDL
2	8.0	BDL	BDL	BDL	14.0	19.0	BDL	BDL	BDL	BDL
3	8.1	70.0		BDL	10.0	23.0	BDL	BDL	BDL	BDL
5	7.4	12.0	BDL	BDL	2.0	16.0	BDL	BDL	BDL	BDL
6	7.4	361.0	0.002	0.010	3.0	16.0	BDL	BDL	BDL	BDL
29 April 1992										
2	7.7	18.0	0.011	BDL	5.0	10.0	BDL	BDL	BDL	BDL
3	7.8	122.0	0.012	BDL	5.0	10.0	BDL	BDL	BDL	BDL
5	7.3	28.0	BDL	BDL	3.0	12.0	BDL	BDL	BDL	BDL
6	7.2	231.0	BDL	0.003	4.0	12.0	BDL	BDL	BDL	BDL
16 July 1992										
1	8.5	22.0	0.001	0.003	8.0	15.0	BDL	BDL	4.8	BDL
2	7.5	22.0	BDL	0.002	4.0	14.0	BDL	BDL	5.4	BDL
3	7.7	21.0	BDL	BDL	6.0	12.0	BDL	BDL	5.7	BDL
5	7.1	47.0	BDL	BDL	5.0	15.0	BDL	BDL	3.1	BDL
6	6.9	110.0	BDL	BDL	5.0	15.0	BDL	BDL	3.1	BDL
11 November 1992										
1		237.0	0.003	0.002	4.0	18.0	BDL	BDL	BDL	BDL
2		7.0	BDL	BDL	3.0	16.0	BDL	BDL	BDL	BDL
3		18.0	BDL	BDL	3.0	14.0	BDL	BDL	BDL	BDL
5		18.0	BDL	BDL	4.0	18.0	BDL	BDL	BDL	BDL
6		67.0	BDL	BDL	4.0	15.0	BDL	BDL	BDL	BDL

Compass Site O&M Surface Sample Results										
ANALYTE	pH	TSS	ARSENIC	LEAD	BOD	TOC	PCB's	BENZENE	Bis (2-ethylhexyl) phthalate	Hexavalent Chromium
UNITS		mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	mg/l
25 February 1993										
1	8.0	BDL	BDL	BDL	2.0	8.0	BDL	BDL	BDL	BDL
2	8.0	BDL	BDL	BDL	2.0	8.0	BDL	BDL	3.8	BDL
3	8.4	BDL	BDL	BDL	2.0	8.0	BDL	BDL	BDL	BDL
5	8.2	BDL	BDL	BDL	4.0	8.0	BDL	BDL	BDL	BDL
6	7.8	BDL	BDL	BDL	2.0	7.0	BDL	BDL	BDL	BDL
6 May 1993										
1	7.6	16.0	0.002	BDL	5.0	18.0	BDL	BDL	18.3	BDL
2	7.6	8.0	BDL	BDL	6.0	18.0	BDL	BDL	17.6	BDL
3	7.9	9.0	BDL	BDL	6.0	19.0	BDL	BDL	BDL	BDL
5	7.8	5.0	0.002	BDL	4.0	18.0	BDL	BDL	BDL	BDL
6	8.2	6.0	BDL	0.001	5.0	17.0	BDL	BDL	BDL	BDL
8 September 1993										
1	7.2	BDL	BDL	BDL	6.0	21.0	BDL	BDL	3.8	BDL
2	7.1	BDL	BDL	BDL	6.0	21.0	BDL	BDL	8.6	BDL
3	7.1	BDL	BDL	BDL	5.0	19.0	BDL	BDL	20.0	BDL
5	7.4	BDL	BDL	BDL	5.0	21.0	BDL	BDL	7.6	BDL
6	7.3	BDL	BDL	BDL	6.0	19.0	BDL	BDL	22.0	BDL
17 November 1993										
1	7.5	6.0	BDL	0.001	2.0	18.0	BDL	BDL	BDL	BDL
2	7.6	5.0	BDL	BDL	2.0	18.0	BDL	BDL	BDL	BDL
3	7.5	BDL	BDL	BDL	2.0	18.0	BDL	BDL	BDL	BDL
5	7.4	16.0	BDL	BDL	2.0	17.0	BDL	BDL	BDL	BDL
6	7.6	11.0	BDL	BDL	4.0	18.0	BDL	BDL	BDL	BDL

Compass Site O&M Surface Sample Results										
ANALYTE	pH	TSS	ARSENIC	LEAD	BOD	TOC	PCB's	BENZENE	Bis (2-ethylhexyl) phthalate	Hexavalent Chromium
UNITS		mg/l	mg/l	mg/l	mg/l	mg/l	ug/l	ug/l	ug/l	mg/l
1 March 1994										
1	7.1	6.0	BDL	BDL	17.2	13.0	BDL	BDL	BDL	BDL
2	7.3	6.0	BDL	BDL	31.8	20.0	BDL	BDL	5.5	BDL
3	7.6	11.0	BDL	BDL	19.0	15.0	BDL	BDL	BDL	BDL
5	7.7	2.0	BDL	BDL	9.7	15.0	BDL	BDL	BDL	BDL
6	7.1	3.0	BDL	BDL	8.6	13.0	BDL	BDL	BDL	BDL
2 May 1994										
1	8.1	4.0	BDL	BDL	2.3	105.0	BDL	BDL	BDL	BDL
2	7.8	7.0	BDL	BDL	2.0	12.1	BDL	BDL	BDL	BDL
3	7.7	6.0	BDL	BDL	2.3	11.2	BDL	BDL	BDL	BDL
5	7.9	5.0	BDL	BDL	2.3	11.1	BDL	BDL	BDL	BDL
6	7.2	4.0	BDL	BDL	2.3	11.5	BDL	BDL	BDL	BDL
6 September 1994										
1	7.5	10.0	BDL	BDL	BDL	9.8	BDL	BDL	BDL	BDL
2	7.5	9.0	BDL	BDL	2.0	15.1	BDL	BDL	BDL	BDL
3	7.6	5.0	BDL	BDL	BDL	13.8	BDL	BDL	BDL	BDL
5	7.4	4.0	BDL	BDL	BDL	23.6	BDL	BDL	BDL	BDL
6	7.4	19.0	BDL	BDL	2.8	22.4	BDL	BDL	BDL	BDL
7 November 1994										
1	7.4	3.0	BDL	BDL	1.2	7.3	BDL	BDL	BDL	BDL
2	7.4	3.0	BDL	BDL	BDL	4.5	BDL	BDL	BDL	BDL
3	7.6	9.0	BDL	BDL	4.0	6.8	BDL	BDL	BDL	BDL
5	7.5	5.0	BDL	BDL	BDL	6.3	BDL	BDL	BDL	BDL
6	7.4	7.0	BDL	BDL	1.6	6.1	BDL	BDL	BDL	BDL

Attachment 6

Cap Vent & Settlement Data

1994 Vent Monitoring Results

(Organic Vapor Analyzer Readings, ppm)

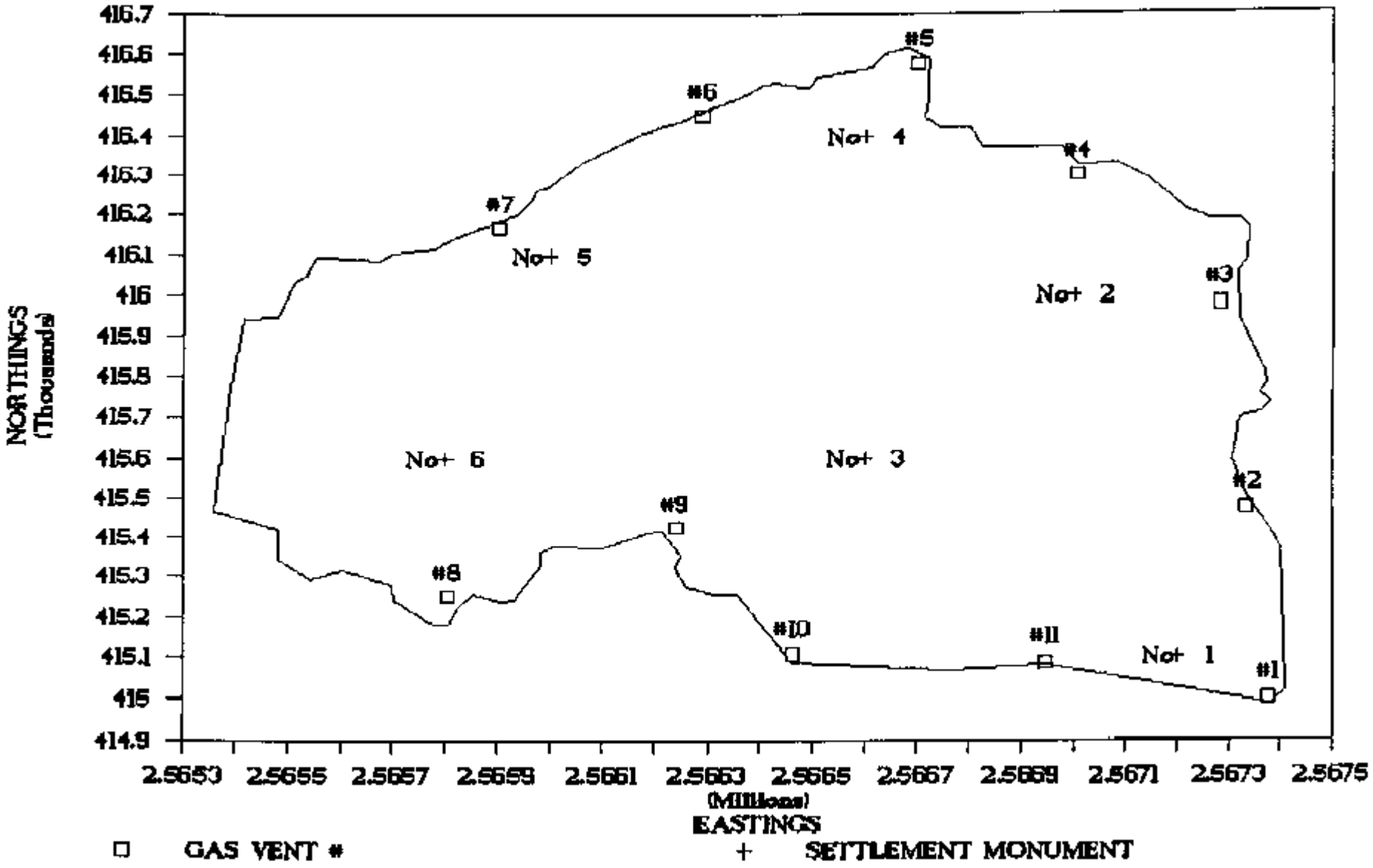
Month	Vent No.										
	1	2	3	4	5	6	7	8	9	10	11
Jan-94	BDL	BDL	50	BDL	BDL	BDL	BDL	1,000	BDL	1,000	BDL
Feb-94	BDL	BDL	100	BDL	BDL	BDL	BDL	1,000	BDL	1,000	BDL
Mar-94	BDL	BDL	80	BDL	BDL	BDL	BDL	100	BDL	1,000	BDL
Apr-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	50	BDL	BDL
May-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	100	BDL	BDL
Jun-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	80	BDL	BDL
Jul-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	100	BDL	BDL
Aug-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	100	BDL	BDL
Sep-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	80	BDL	BDL
Oct-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	80	BDL	BDL
Nov-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	80	BDL	BDL
Dec-94	BDL	100	BDL	BDL	BDL	BDL	BDL	1,000	50	BDL	BDL

Attachment 6

Cap Vent & Settlement Data

COMPASS INDUSTRIES SUPERFUND SITE, OK

GAS VENT & SETTLEMENT MONUMENT LOCATION



1994 Vent Monitoring Results

(Organic Vapor Analyzer Readings, ppm)

Month	Vent No.										
	1	2	3	4	5	6	7	8	9	10	11
Jan-94	BDL	BDL	50	BDL	BDL	BDL	BDL	1,000	BDL	1,000	BDL
Feb-94	BDL	BDL	100	BDL	BDL	BDL	BDL	1,000	BDL	1,000	BDL
Mar-94	BDL	BDL	80	BDL	BDL	BDL	BDL	100	BDL	1,000	BDL
Apr-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	50	BDL	BDL
May-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	100	BDL	BDL
Jun-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	80	BDL	BDL
Jul-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	100	BDL	BDL
Aug-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	100	BDL	BDL
Sep-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	80	BDL	BDL
Oct-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	80	BDL	BDL
Nov-94	BDL	1,000	BDL	BDL	BDL	BDL	BDL	1,000	80	BDL	BDL
Dec-94	BDL	100	BDL	BDL	BDL	BDL	BDL	1,000	50	BDL	BDL

10 August 1994

Scott Stelle
8822 South 75th East Avenue
Tulsa, Oklahoma 74135

Breisch & Associates
SURVEYING • ENGINEERING
Thirty South Main — Sand Springs, Oklahoma 74063 — (918) 245-8702

Subject: Compass Industries Superfund Site
Monitoring Data for the Settlement Markers

Dear Mr. Stelle:

Below are the results of our survey for the referenced markers. The numbering system is consistent with that of Bechtal. The elevations were taken on July 1, 1994.

SETTLEMENT MARKERS

	No. 1	No. 2	No. 3	No. 4	No. 5	No. 6
(By Others) 10-19-90	860.74	847.58	846.15	832.54	822.40	823.34
(Breisch) 9-27-91	860.76	847.50	846.17	832.45	822.30	823.21
Movement	Up 0.02	Down 0.08	Up 0.02	Down 0.09	Down 0.10	Down 0.13
(Breisch) 6-25-92	860.75	847.43	846.01	832.48	822.31	823.23
Movement	Down 0.01	Down 0.07	Down 0.16	Up 0.03	Up 0.01	Up 0.02
(Breisch) 10-19-93	860.75	847.51	846.13	832.60	822.44	823.36
Movement	0	Up 0.08	Up 0.12	Up 0.12	Up 0.13	Up 0.13
(Breisch) 7-01-94	860.73	847.47	846.09	832.58	Unable to Locate	823.34
Movement	Down 0.02	Down 0.04	Down 0.04	Down 0.02		Down 0.02

Alan J. Ringle
Vice President

AJR/ms

Taken from J. Scott Stelle, R.E.M.
1994 Annual Monitoring Report